

IT Impact on Management Education Using the Case Method

Completed Research Paper

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Abstract

Information technology (IT) has become rapidly accepted as a complement or substitute of the traditional learning setting, hence challenging Management education. This research examines the impact of IT platforms on Management education using the case method. We theorize that traditional learning platforms may enable instructors to engage students to increase learning performance, which in turn leads to a greater student satisfaction. Social media applications (i.e., social media for teaching activities) may amplify the relationships between traditional learning platforms, student engagement, learning performance, and student satisfaction. Using the variance-structural equation modeling technique, and the partial least squares method of estimation on a combination of survey and secondary data from 94 Spanish students from a Management course, the empirical analysis gives support to our theory.

Keywords

IT platforms, student engagement, learning performance, student satisfaction.

Introduction

Information technology (IT) is changing the way firms and individuals operate and interact (Benitez & Walczuch 2012). The mode of teaching and interacting with students is changing dramatically with the expansion of Internet as a way to deliver course content (Brower 2003). In a digital environment, Management scholars have the challenge to discover what IT resources use and how to leverage these IT resources to improve student learning and satisfaction. IT platforms (e.g., Moodle-based learning platforms, Facebook, Twitter) are becoming rapidly accepted to complement the traditional (i.e., face-to-face) classroom/teaching.

Prior Information Systems (IS) and Management Learning literature has mainly focused on opinion and discussion pieces describing student motivation (Arenas et al. 2012), student expectations (Ma et al. 2000), or learning quality (Piccoli et al. 2000; Redpath 2012) acquired from online learning compared with traditional learning. A few exceptions have studied the impact of student's interaction and collaboration in interactive IT platforms (e.g., discussion forums, wikis) on student learning outputs (Arbaugh & Benbunan 2007; Daspit & D'Souza 2012; Kane & Fichman 2009).

To the best of our knowledge, little has been studied about the role of different IT platforms (i.e., traditional learning platforms, social media applications) on blended learning Management education in the case method context. The case method is very useful in learning as students can interact about decisions and actions to take in real life. The aim of this study is to provide Management scholars the base to successfully use IT platforms in interactive learning environments (i.e. in the case method context) in a blended learning course.

Prior IS research has classified IT-based media in conventional and social media (Braojos et al. 2015a). We draw on these studies to differentiate two types of IT platforms that may be potentially used in

Management education: traditional learning platforms and social media applications. Traditional learning platforms are more conventional and less interactive course-specific platforms (e.g., Moodle-based learning platform, e-mail, instructor's web site). Social media applications refer to external social media such as Facebook, Twitter, and YouTube, which are highly interactive and very popular among the students. Based on the gaps discovered on prior literature, we formulate the following research questions: How does IT affect student learning performance and satisfaction in a blended learning Management course? Does the complementary usage of traditional learning platforms and social media applications amplify the student learning output (i.e., learning performance, student satisfaction)?

We examine the impact of traditional learning platforms and social media applications on Management education using the case method. Our central thesis is that traditional learning platforms may enable instructors to engage students to increase student learning performance, which in turn leads to a greater student satisfaction. We theorize that social media applications may amplify the relationships between traditional learning platforms, student engagement, learning performance, and student satisfaction. The theory is tested using the variance-based structural equation modeling (SEM) technique and the partial least squares (PLS) method of estimation on a sample of 94 undergraduate Spanish students from a Management course using the case method.

Theory and Hypotheses

The Community of Inquiry Framework, and the Uses and Gratifications Framework

The community of inquiry framework provides the key elements needed to theoretically explain a successful educational experience. It describes how complementary factors (teaching presence, social presence, and cognitive presence) enable student learning in online environments. The framework of community of inquiry assumes that learning occurs through the interaction of teaching presence, social presence, and cognitive presence. Teaching presence refers to the instructor's ability to facilitate discourse, engage in interactions and direct instructions. Continuous instructor presence (e.g., by short messages guiding activities) can increase student's activity. Social presence refers to the perception of openness and communication that facilitates interpersonal communications (interactions between student-student and instructor-student) (Redpath 2012). The process of social presence is easily done in an interactive and social environment, where collaborative activities take place. Cognitive presence is the basic element in a successful learning as it refers to the construction of knowledge through communication (Arbaugh & Benbunan 2006). It denotes the student's ability to absorb and create new knowledge (Redpath 2012). The elements of the community of inquiry can facilitate learning quality and outcomes. We draw from the community of inquiry framework to theoretically explain the complementary role of social media applications in the relationships between traditional learning platforms, student engagement, and learning performance.

The uses and gratifications framework is a model of user choice of new information technologies which evaluates the user (e.g., customer, student, and instructor) motivation to use IT such as Internet (Stafford et al. 2004), or virtual environments (Nambisan & Baron 2009). Users made IT usage decisions based on the perceived gratifications/benefits they can gain from that usage (Braojos et al. 2015a). This framework identifies four motivators to use IT: cognitive (benefits come from knowledge acquisition), social integrative (benefits derive from user ties with others), personal integrative (gains in reputation and status), and hedonic/affective (enjoyment and pleasurable experiences). Student's perception of these four types of benefits can shape their involvement and satisfaction with the course through the usage of IT platforms. We draw from this framework to link traditional learning platforms and student engagement, and to theoretically explain the potential moderating effects of social media applications on our proposed model.

Traditional Learning Platforms and Student Engagement

Traditional learning platforms are the information technologies that afford students to be connected with the course in everywhere and at any time (Piccoli et al. 2000). They are more traditional, less interactive, and are provided internally by the Business School (e.g., Moodle-based learning platform, e-mail, instructor's web site) with the main goals to facilitate the communication between instructor and students.

Student engagement refers to the degree of emotional commitment, motivation, and involvement of a student to collaborate, participate, and contribute during the course activities (Arbaugh & Benbunan 2007).

The usage of traditional learning platforms as a complement of traditional classroom setting may enable a greater student engagement in the course. First, the instructor may use traditional learning platforms to provide the course syllabus and teaching material, and update the course information to the students. Students are more able to be engaged in the course if teaching material is provided beforehand by traditional learning platforms (Taras et al. 2013), and they receive critical information on the course in an agile way through IT (Brower 2003).

Second, traditional learning platforms are suitable tools to organize the teaching material or to quickly solve doubts about the course (e.g., by email). Students can positively evaluate these instructor efforts in providing teaching materials in a structured way, or quickly solving doubts through traditional learning platforms. This positive evaluation may make students to become more willing to participate and collaborate in the learning process. Finally, web technologies provide students with more learning flexibility to work from home at their own pace. Keeping in touch with the instructor by traditional learning platforms such as the e-mail or the instructor web site at any time and any place provide the student with a greater flexibility and freedom. This flexibility is viewed by students as a benefit in effectively managing time, which provokes a greater autonomy and responsibility for their own learning to increase student engagement. We therefore hypothesize:

Hypothesis 1 (H1): There is a positive relationship between traditional learning platforms and student engagement.

Student Engagement and Learning Performance

Learning performance refers to the extent to which students achieve the course learning goals in terms of knowledge acquisition, understanding key concepts, and developing managerial skills (Alavi et al. 1997). Student engagement may increase learning performance. As long as the student feels a sense of commitment with the learning process, their knowledge assimilation can improve. First, engaged students are more able to collaborate and create new experiences in class, which can improve their knowledge acquisition (Hwang & Francesco 2010). Motivated students can explore, construct, and absorb higher levels of learning in the way they feel part of the learning process (Daspit & D'Souza 2012).

Second, motivated students can obtain better learning performance because the Pygmalion effect (Armstrong et al. 2004). In general, motivated students want to make the most of the course; hence, students' previous belief that they can get a superior learning can be effectively fulfilled at the end of the course (i.e., Pygmalion effect) (Crossan et al. 2013). Finally, a greater control of the students over the learning activities can improve their learning performance (Piccoli et al. 2000; Redpath 2012). When students are involved in the course, they can improve their learning outcomes. For example, with the case method students have the opportunity to face decision-making processes, hence feeling part of the process of learning, which enhances student engagement to increase learning performance. We hypothesize that:

Hypothesis 2 (H2): There is a positive relationship between student engagement and learning performance.

Learning Performance and Student Satisfaction

Student satisfaction refers to the degree in which the student expectations on the instructor, course, and teaching method are met. Learning performance may increase student satisfaction. Students with better learning outcomes may feel a positive affection toward the instructor, who can be seen as a critical agent in their learning process. The student satisfaction with the course design and teaching method may be derived from the extent the student had assimilated knowledge, understood critical management concepts, and learned to identify central topics, make managerial decisions and solve key business problems. Therefore, it is rational to expect that:

Hypothesis 3 (H3): There is a positive relationship between learning performance and student satisfaction.

The Amplifier Role of Social Media Applications in the Relationship between Traditional Learning Platforms and Student Engagement

Social media applications are social and interactive applications that may facilitate collaboration and connection with students (Braojos et al. 2015b). Social media applications refer to social tools for teaching activities in the context of the course (e.g., Facebook, Twitter, Pinterest, LinkedIn, Google +) (Daspit & D'Souza 2012; Kane & Fichman 2009). These social media can be used by firms for business activities, by individuals for enjoyment, and by instructors and students for teaching/learning activities (Braojos et al. 2015a).

We argue that in presence of social media applications, the relationship between traditional learning platforms and student engagement can be stronger, that is, social media applications can perform an amplifier role. Based on the community of inquiry framework, we argue that social media applications contain functionalities that allow instructors to facilitate discussion forums and create an environment of social interaction among students (Daspit & D'Souza 2012). Certainly, these superior functionalities enabled by social media applications, increases the opportunity to leverage traditional learning platforms to create a sense of commitment among students to be part of the learning process.

Drawn from the uses and gratifications framework, students can engage in social media applications motivated by cognitive, social integrative, personal integrative, and hedonic perceived benefits (Stafford et al. 2004). Social media applications (i.e., social media for teaching activities) are more user-friendly, flexible, agile, newer, and closer to the students as compared with traditional learning platforms. Students can complementary use social media applications, in addition to traditional learning platforms, for a variety of reasons. In this sense, Facebook or WhatsApp are efficient tools to informally communicate and get last minute information from other students. Twitter can be used by the instructor to run some additional questions in advance to the case discussion in class. Similarly, Twitter can be used to recognize the best in class on the case discussion. Thus, students can use social media applications to stay informed about the course activities and because the conception of group they perceived on the platform. Hence, student engagement enabled by traditional learning platforms can be stronger when the instructor also uses social media tools in the course. Then, it is rational to expect that traditional learning platforms and social media applications can be complementary to achieve student engagement:

Hypothesis 4 (H4): Social media applications positively amplify the relationship between traditional learning platforms and student engagement.

The Amplifier Role of Social Media Applications in the Relationship between Student Engagement and Learning Performance

We argue that the relationship between student engagement and learning performance can be also amplified by social media applications. Drawn from the community of inquiry framework, social interrelatedness enabled by social media applications may promote student collaborative learning in online environments in the way students freely express their opinions and experiences (Brower 2003; Daspit & D'Souza 2012; Taras et al. 2013). Learning happens when instructors and students can confront different points of view, exchange, share, and integrate knowledge (Brower 2003). Interactive technologies such as social media engage more students in the learning process as they enable a higher monitoring of student progress (Arenas et al. 2012), which may lead to a greater learning performance. Hence, the student engagement effect on learning performance can be positively amplified in presence of social media applications.

Based on the uses and gratifications framework, social media applications may provide a useful and enjoyable environment that encourages students interact with others in the learning community. For example, instructors can use Second Life (a social media platform) to facilitate learning. When motivated students face the challenge to act in a real life situation (e.g., in Second Life), students can enjoy the experience and achieve stronger learning outcomes, thus maximizing their learning performance based on their engagement.

Social media applications are well suited tools to provide more thoughtful student comments, encourage shy students to participate and avoid monopolization of dominant/leader students (Brower 2003; Redpath 2012), something that may happen in some case discussion sessions. In this sense, engaged

students may use social media applications as a second opportunity to participate in the virtual/social case discussion to improve their learning performance (Hwang and Francesco 2010). For example, the instructor can use Twitter to run additional questions before/after the class discussion to give all the students the opportunity to participate. Based on this discussion, we hypothesize that:

Hypothesis 5 (H5): Social media applications positively amplify the relationship between student engagement and learning performance.

The Amplifier Role of Social Media Applications in the Relationship between Learning Performance and Student Satisfaction

We also claim that in presence of social media applications, the relationship between learning performance and student satisfaction can be stronger, that is, social media applications may perform a positive amplifier role. Social media applications enable a greater interaction among students and the instructor. Based on the uses and gratifications framework we argue that students may experiment socio-emotional benefits toward the online-learning community in the extent they experience less isolation in the learning process (Arbaugh & Benbunan 2007; Arenas et al. 2012). Complex tasks are perceived easier with the support of the community (instructor and other students). Then, more interactions between student-student and instructor-student through social media applications may reinforce the student satisfaction generated through the learning (Arbaugh & Benbunan 2007). Social media applications are flexible tools considered as useful to solve doubts and save time, hence creating a positive attitude toward the course. Moreover, with the usage of social media applications students can perceive a sense of belonging and enjoyment that can make students improve their satisfaction at the time they learn. Hence, student satisfaction generated through the learning can be stronger when social media applications are used:

Hypothesis 6 (H6): Social media applications positively amplify the relationship between learning performance and student satisfaction.

Research Methodology

Sample and Data

The proposed model is tested based on a combination of survey and secondary data from 94 Spanish students from a Management course offered at the School of the authors. This course was taught using the lecturing combined with the case method. In addition, the instructor used several traditional learning platforms (e.g., teaching platform, email), and social media applications (e.g., Twitter, Skype, Pinterest) in the execution and development of the course to work and interact with the students.

First, we performed a brainstorming session with the students to obtain an overall understanding about the role of IT in the course. Then, we carefully designed a questionnaire, wherever possible, by adapting scales from prior research on IS and Management Learning. After that, the questionnaire, including a cover letter with instructions, was given to students in the last session of the course (in June 2015). On average, the age of the respondent is 24 (S.D. = 4.951) with a range of 20 to 44.

Measures

Traditional learning platforms and social media applications are measured by adapting the scale of Lu et al. (2013). Traditional learning platforms assess the extent to which students use traditional learning platforms (Moodle-based learning platforms, email, instructor's web site, laptop) for teaching activities. Social media applications assess the level of external social media platforms (Facebook, Twitter, Pinterest, LinkedIn, Google +) usage to execute course activities. We created a three new indicators scale to measure student engagement. We measure learning performance by adapting the scales of Alavi et al. (1997), and Daspit and D'Souza (2012). Student satisfaction is specified as a composite second-order construct determined by instructor satisfaction, course satisfaction, and teaching method satisfaction. Instructor satisfaction is a newly developed scale in the study. Course satisfaction is based in the scale of Arbaugh and Benbunan (2007). Teaching method satisfaction is measured by adapting the scales of Alavi et al. (1997), Arenas et al. (2012), and Daspit and D'Souza (2012). All constructs are specified as composite

(Ajamieh et al. forthcoming). This study controls for student age, student gender, prior IT student skills, and instructor reputation (e.g., Arbaugh & Benbunan 2007).

Empirical Analysis

We use the variance-based SEM technique and the PLS method of estimation to test the hypotheses and to examine the mediation effects involved in the proposed model. PLS method of estimation is appropriate for the following reasons. First, PLS is a full-fledged SEM approach that can test for exact model fit (Henseler et al. 2016). Second, this method of estimation is particularly advisable and provides consistent estimations in models that use composite constructs, as the proposed model (Wang et al. 2015). Third, compared with covariance-based SEM techniques, PLS provides better estimations when estimating complex models (i.e., with multidimensional constructs) (Hair et al. 2012). Finally, PLS is advisable when some constructs of the model use newly developed scales, as this study (Tiwana & Konsynski 2010). We use the statistical software package Advanced Analysis for Composites (ADANCO) 2.0 Professional (<http://www.composite-modeling.com/>) (Henseler & Dijkstra 2015). We use the bootstrapping algorithm with 5000 subsamples to estimate the level of significance of weights, loadings, and path coefficients.

Measurement Model Evaluation

We check the content validity of all the constructs included in our study, wherever possible, by using scales previously validated in prior research (Pavlou & El Sawy 2006; Wang et al. 2015). After the data collection, we check for multicollinearity by calculating the indicator variance inflation factors (VIFs). The indicator VIFs for our constructs range from 1.016 to 3.757 well below the accepted threshold of 10, which it suggests that multicollinearity is not a problem in our constructs (Benitez & Ray 2012). After checking multicollinearity, a composite indicator should be retained when its weight is significant, or when its weight is not significant but loading it is (Petter et al. 2007). However, composite indicators/dimensions which weight and loading are non-significant can be retained at discretion of the author team to preserve the construct content validity (Cenfetelli & Bassellier 2009). We also find that neither the weight nor the loading of one indicator of traditional learning platforms construct referring to the use of the email is significant. We have decided to keep this indicator to preserve the content validity of the construct (Ajamieh et al. forthcoming).

Test of Hypotheses

We perform a PLS estimation and analyze the effect size (f^2) for the hypothesized relationships to test the proposed research model. Thus, we examine the path coefficients, level of significance, R^2 , and f^2 values to test the hypotheses. Path coefficients, their level of significance, and the R^2 values are individual measures of the structural quality and explanatory power of the model. Path coefficients around 0.200 are considered economically significant (Benitez & Ray 2012). Main path coefficients in our model range from 0.193* to 0.494**, being significant at the 0.05 level. R^2 values higher than 0.200 indicate good explanatory power of the endogenous variables of the model (Chin 2010). The R^2 values for the endogenous variables range from 0.176 to 0.815. The empirical analysis provides support for all our hypotheses at 0.05 level. Related to the control variables, none of them has a significant effect on student satisfaction. Figure 1 shows the estimation of the proposed model.

f^2 values lower than 0.020, greater than 0.150, and greater than 0.350 indicate weak, medium, or large effect size of adding a link between an exogenous and endogenous variable (Henseler & Fassott 2010). The f^2 values involved in the hypothesized relationships range from 0.037 to 0.475 (Table 1). Overall, this analysis suggests good explanatory power for the proposed model.

This study also examines the standardized root mean squared residual (SRMR), unweighted least squares (ULS) discrepancy (d_{ULS}), and geodesic discrepancy (d_G) at first- and second-order level to evaluate the goodness of structural model fit (Henseler & Dijkstra 2015). These goodness of fit measures evaluate the discrepancy between the empirical correlation matrix and the model-implied correlation matrix (Benitez & Ray 2012). The lower they are, the better the fit of the research model (Henseler & Dijkstra 2015). Both measurement models, at the first and second-order steps, should not be rejected based on the alpha level of 0.05 as all discrepancies are below the 95%-quantile of the bootstrap discrepancies (Table 2). Overall,

the analysis suggests that there is good structural fit between the model and data at first- and second-order level (Henseler & Dijkstra 2015).

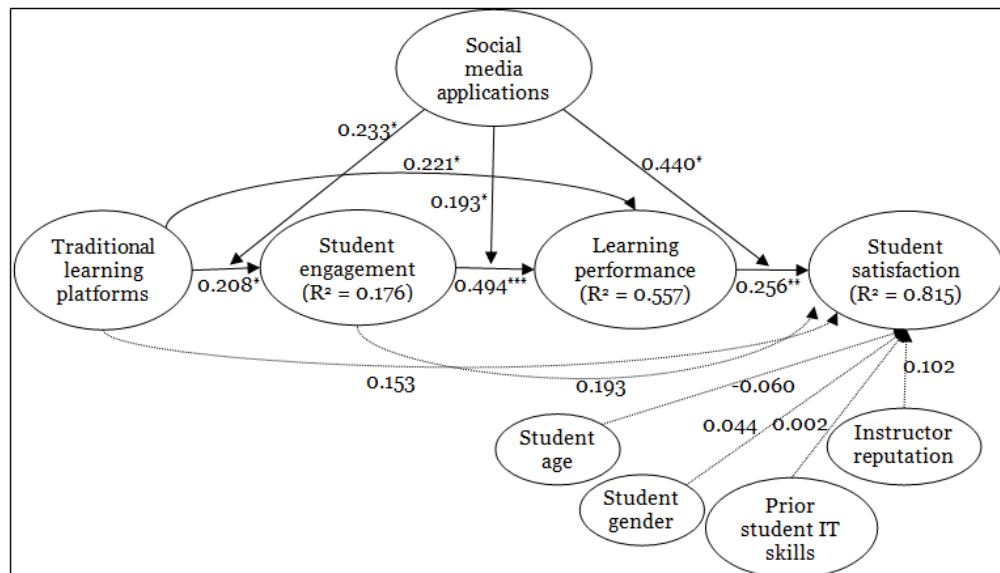


Figure 1. Test of Hypotheses (* $p < 0.05$, ** $p < 0.01$, *** $p < 0.001$, one-tailed test)

Relationship	f ² value	Effect size
Hypothesized relationship	f ² value	Effect size
Internal IT platforms → Student engagement (H1)	0.037	Weak
Student engagement → Learning performance (H2)	0.447	Large
Learning performance → Student satisfaction (H3)	0.144	Medium
Internal IT platforms * External IT platforms → Student engagement (H4)	0.041	Weak
Student engagement * External IT platforms → Learning performance (H5)	0.047	Weak-medium
Learning performance * External IT platforms → Student satisfaction (H6)	0.475	Large
Control variables	f ² value	Effect size
Student age → Student satisfaction	0.016	Weak
Student gender → Student satisfaction	0.010	Very weak
Prior student IT skills → Student satisfaction	0.000	Zero
Instructor reputation → Student satisfaction	0.054	Weak-medium

Table 1. Effect Size Analysis

Discrepancy	First step			Second step		
	Value	HI95	Conclusion	Value	HI95	Conclusion
SRMR	0.079	0.088	Supported	0.083	0.171	Supported
d _{ULS}	3.753	4.648	Supported	3.894	16.433	Supported
d _G	1.964	3.392	Supported	2.111	5.588	Supported

Table 2. Structural Model Fit Evaluation

Mediation Analysis

A mediation analysis is conducted to examine the mediation effects involved in the proposed model. We add to the base model a link between: (1) traditional learning platforms and learning performance, (2) traditional learning platforms and student satisfaction, and (3) student engagement and student

satisfaction. All the indirect effects are significant at 0.05 level, which reinforces the results obtained in the test of hypotheses (Zhao et al. 2010) (Table 3)

Relationship	Direct effect	Indirect effect
Traditional learning platforms→ Learning performance	0.221*	0.103*
Traditional learning platforms→ Student satisfaction	0.153	0.123*
Student engagement→ Student satisfaction	0.193	0.126**

Table 3. Mediation Analysis

Test of Robustness

We check for the robustness of the proposed model in two ways. First, we triangulate the measurement model by measuring learning performance with secondary data on the grade obtained by the student in the course. We correlate learning performance measured with survey data and learning performance measured with secondary data and they are correlated (0.403***), which gives additional credibility to our perceptual measure on learning performance (Benitez & Ray 2012). This analysis suggests that measurement specifications are not a concern in our empirical analysis.

Second, we check the robustness of the structural model. Since it may be discussed that a greater course satisfaction may be positively related with learning performance, we consider an alternative model in which student satisfaction influences learning performance, keeping every other relationship the same. In this model the moderating effect of social media applications on the link between student satisfaction and learning performance is not significant, and the model have greater discrepancy values (SRMR, d_{ULS} , and d_G) as compared with the proposed model, which indicates a poorer goodness of fit.

Discussion and Conclusions

We find that traditional learning platforms influence student satisfaction through student engagement and learning performance, and social media applications reinforce these effects. First, the usage of traditional learning platforms as a complement of classroom setting enables a greater student engagement because the instructor's efforts in providing structured teaching materials, updating the course content information or quickly solving doubts through information technologies such as Moodle-based learning platform or e-mail. Second, as long as the student feels a sense of involvement with the learning process, its knowledge perception improves due to the collaborative environment created in class. Engaged students are more motivated to collaborate and create new discussion experiences at the time they feel a sense of control over the learning process. Third, the learning outcomes obtained effectively affect the student satisfaction with the instructor, course, and teaching method. Student satisfaction is thus explained by the extent students assimilate knowledge and learn to make managerial decisions to solve business problems. Finally, social media applications perform an amplifier role on these relationships because the interactivity and conception of group, which make easier the student involvement in the process of learning, their effective knowledge acquisition and satisfaction with the course. Social interactivity, agility, enjoyment, and conception of group revealed in social media applications (e.g., Facebook, Twitter) can strongly explain the student satisfaction.

Our research has the following contributions to research on IS and Management Learning. While prior research has focused in comparing the outcomes of traditional and online learning (e.g., Redpath 2012), we explore the role of traditional learning platforms and social media applications in blended learning Management courses using the case method. The first contribution of this study is the conceptualization of IT platforms and its classification in traditional learning platforms and social media applications as an enabling (i.e., learning platform) and complementary resource (social media applications) in Management education using the case method. Second, this research theorizes, theoretically explains, and empirically demonstrates how traditional learning platforms increase student satisfaction by enabling student engagement and improving learning performance. The third incremental contribution of this paper is to investigate and theorize the role of social media in Management Learning using the case method. Finally, we consider learning performance as exogenous of student satisfaction. Our study is the first in exploring empirically the direct relationship between learning performance and student satisfaction. While some studies consider interactivity (among students, and among students and the instructor) and social capital as antecedents of perceived learning and student satisfaction (Arbaugh & Benbunan 2007; Lu et al. 2013),

surprisingly, any prior study has explored the relationship between learning performance and student satisfaction.

This study also provides key teaching lessons to Management instructors. We provide answers to the question of complementary or overlapping using traditional learning platforms and social media applications in a Management course. A case method-based course of Management can be improved with the usage of traditional learning platforms and social media applications. The usage of traditional learning platforms engages the student to improve its learning performance and student satisfaction. Once the traditional learning platforms are being used, it is critical to carefully decide and select whether and what social media may be used. If this is performed effectively, social media can positively reinforce the IT-based improvement of the teaching activities of the course. This study reports instructors that traditional learning platforms and social media applications dance together in the execution of the learning activity, hence improving the student learning output (i.e., learning performance and student satisfaction). In conclusion, the combination of traditional classroom setting with IT platforms improves the interactive learning process in Management education. Blended learning based on a combination of traditional information technologies (traditional learning platforms) with more interactive and user friendly information technologies (social media applications) enable a better learning performance that ends up with a greater satisfaction of the students.

Acknowledgments

This research was sponsored by the European Regional Development Fund (European Union), and the Spanish Government (Research Projects ECO2010-15885 and ECO2013-47027-P), the Regional Government of Andalusia (Research Project P11-SEJ-7294), and the COVIRAN-Prodware Chair of Digital Human Resource Strategy at the School of Human Resource Management of the University of Granada.

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